

REMARKS/ARGUMENTS

Claims 1-13, 15-20, and 22-28 are pending. Claims 14, 21, 29, and 30 have been canceled without prejudice. Claims 15, 17, and 18 have been amended. No new matter has been introduced. Applicants believe the claims comply with 35 U.S.C. § 112.

Applicants note with appreciation the indicated allowability of claim 21 if rewritten in independent form. Independent claim 18 has been amended by incorporating the feature of claim 21. Therefore, claim 18 and claims 19, 20, and 22-28 depending therefrom are allowable.

Claims 1 and 5-8 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Singh et al. (USP 6,191,046).

Applicants respectfully submit that independent claim 1 is novel and patentable over Singh et al. because, for instance, Singh et al. does not teach or suggest depositing a nitrogen-containing fluorinated silicate glass layer onto the substrate. Nor does Singh et al. disclose forming a barrier layer over the nitrogen-containing fluorinated silicate glass layer.

Singh et al. merely discloses forming an FSG layer 26 "by PECVD using SiF₄, TEOS and O₂ as reactants" (col. 5, lines 40-42). "Alternatively, SiF₄, TEOS, O₂ or N₂, and NF₃ or F₂ may be used as reactants to produce an FSG film." Column 5, lines 42-43. Singh et al. says nothing about depositing a nitrogen-containing fluorinated silicate glass layer. Moreover, there is no barrier layer formed over the FSG layer 26. The layer 25 is merely an ARC which is formed below, not over, the FSG layer 26.

For at least the foregoing reasons, claim 1 and claims 5-8 depending therefrom are novel and patentable over Singh et al.

Claims 2-4, 9-13, and 15-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Singh et al. in view of Lin et al.

Applicants respectfully assert that dependent claims 2-4 and 9-13 are patentable over Singh et al. and Lin et al. because, for instance, they do not teach or suggest depositing a nitrogen-containing fluorinated silicate glass layer from a gaseous mixture comprising a silicon-containing gas, a fluorine-containing gas, an oxygen-containing gas, and a nitrogen-containing

gas; and forming a barrier layer over the nitrogen-containing fluorinated silicate glass layer, as recited in claim 1 from which claims 2-4 and 9-13 depend.

As discussed above, Singh et al. merely discloses depositing an FSG layer, not a nitrogen-containing fluorinated silicate glass layer. Singh et al. also fails to disclose forming a barrier layer over the nitrogen-containing fluorinated silicate glass layer. The Examiner alleges that Lin et al. provides the missing teaching. Lin et al., however, also fails to teach or suggest depositing a nitrogen-containing fluorinated silicate glass layer from a gaseous mixture comprising a silicon-containing gas, a fluorine-containing gas, an oxygen-containing gas, and a nitrogen-containing gas.

Moreover, there is no motivation to combine Lin et al. and Singh et al. as alleged by the Examiner. Lin et al. is directed to a method of fabricating barrier adhesion to low-K dielectric layers in a copper damascene process, but Singh et al. merely discloses a method of reworking a photoresist used to pattern a semiconductor structure and has nothing to do with barrier adhesion, low-K dielectric layers, or copper damascene process.

Indeed, Applicants respectfully assert that the rejection based on the combination of Singh et al. and Lin et al. benefits from the exercise of hindsight. Federal Circuit "case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references." *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999) (citations omitted). To guard against the tempting trap of hindsight, the evidence of a suggestion, teaching, or motivation to combine "must be clear and particular." *Dembiczak*, 50 U.S.P.Q.2d at 1617 (citation omitted). "Broad conclusory statements regarding the teaching of multiple references, standing alone, are not 'evidence.'" *Id.* (citations omitted). "Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight." *Id.* (citing *Interconnect Planning Corp. v. Feil*, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985)). In this case, the Examiner has pieced together the separate teachings of two distinct references to defeat patentability with the benefit of hindsight.

For at least the foregoing reasons, Applicants respectfully contend that claims 2-4 and 9-13 are patentable over Singh et al. and Lin et al.

Applicants respectfully submit that independent claim 15 is patentable over Singh et al. and Lin et al. because, for instance, they do not teach or suggest forming a nitrogen-containing fluorinated silicate glass layer from a gaseous mixture comprising a silicon-containing gas, a fluorine-containing gas, an oxygen-containing gas, and a nitrogen-containing gas; and depositing the nitrogen-containing fluorinated silicate glass layer onto a barrier layer which is formed over a metal layer.

As discussed above, Singh et al. merely discloses depositing an FSG layer, not a nitrogen-containing fluorinated silicate glass layer. Singh et al. also fails to disclose forming a the nitrogen-containing fluorinated silicate glass layer on a barrier layer which is formed over a metal layer. Lin et al., however, also fails to teach or suggest depositing a nitrogen-containing fluorinated silicate glass layer from a gaseous mixture comprising a silicon-containing gas, a fluorine-containing gas, an oxygen-containing gas, and a nitrogen-containing gas. Furthermore, there is no motivation to combine Lin et al. and Singh et al., which are directed to two distinct methods. As such, the rejection based on the combination of Singh et al. and Lin et al. benefits from the exercise of hindsight.

For at least the foregoing reasons, claim 15 and claims 16-17 depending therefrom are patentable over Singh et al. and Lin et al.

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PATENT

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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